

THE DRAGONFLIES AND DAMSELFLIES (ODONATA) OF BUCK CREEK, PULASKI COUNTY, KENTUCKY¹

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ABSTRACT: Seven families of Odonata representing 32 species were found to inhabit Buck Creek, a fifth-order tributary of the upper Cumberland River. Of these 32 species, 17 were new records for Pulaski County. Buck Creek was found to be relatively undisturbed and of high water quality as indicated by its diverse community of Odonata.

There have been relatively few published surveys of the Odonata from Kentucky. Resner (1970) compiled a list of all known odonate species occurring in the Commonwealth, adding three species to the list. The last additions to Kentucky's species list were by Crowley and Wilson (1979). The current total number of odonate species known for Kentucky is 138.

Buck Creek, a fifth-order tributary of the upper Cumberland River, had exceptionally good water quality and a diverse aquatic fauna (Harker, *et al.* 1979). Recent studies of fishes (Cicerello and Butler, 1985), freshwater Unionidae (Schuster, *et al.* 1989), and Trichoptera (Floyd and Schuster, 1990) have reported large numbers of species for each of these groups of organisms. Because Buck Creek was relatively undisturbed, as reflected in previous studies, it was thought to potentially support a diverse community of odonates.

STUDY AREA

Buck Creek is located in southcentral Kentucky (37° 10' N, 84° 30' W). This stream drains approximately 767 km² in Lincoln, Pulaski and Rockcastle counties. It flows southward for 107.2 km and discharges into the Cumberland River, near Cumberland River km 859. Buck Creek flows entirely within the Eastern Highland Rim subsection of the Interior Low Plateau Physiographic Province (Quarterman and Powell, 1978). The surface geology is composed primarily of Mississippian Age limestone (Schuster, *et al.* 1989).

The land use in the watershed is primarily agricultural. The upper

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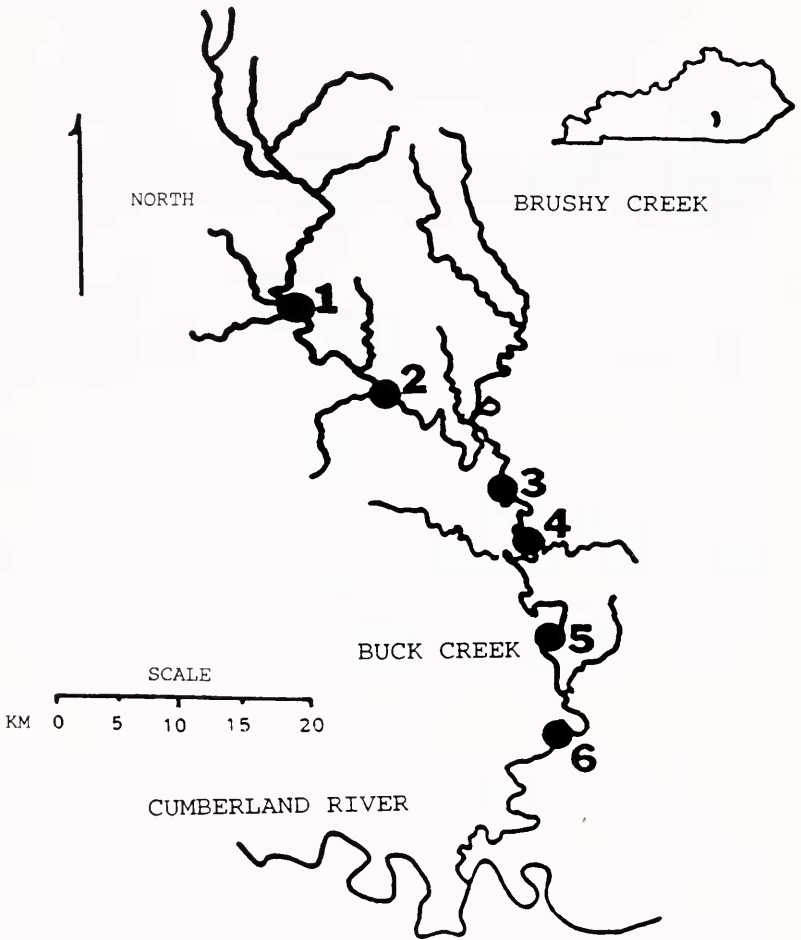


Figure 1. Location of collecting sites along the mainstem of Buck Creek, Pulaski County, Kentucky (after Butler, 1985).

one-half of the watershed is utilized for crop production and the remainder of the watershed lies within the boundary of Daniel Boone National Forest. The stream has numerous braids that become isolated pools during the drier times of the year.

MATERIALS AND METHODS

Six collecting sites were chosen on the mainstem of Buck Creek (Figure 1). Sites one and two were located on the fourth-order section of the stream, and sites three through six were on the fifth-order segment. Exact localities of each collection site are given in Table 1. Two sites were

Table 1. Location of collecting sites on Buck Creek, Pulaski County, Kentucky.

Site	Location
1	State Route (SR) 70 crossing, approximately 4.9 km WNW of Woodstock and 19.4 km N of Somerset.
2	SR 39 crossing, approximately 3.2 km S of Woodstock and 15.9 km NE of Somerset.
3	SR 1677 crossing, approximately 2.2 km W of Dahl and 13.4 km ENE of Somerset.
4	SR 1675 (old SR 80) crossing at Stab, approximately 14.6 km ENE of Somerset.
5	SR 1003 crossing, approximately 7.2 km S of Stab and 14.6 km E of Somerset.
6	SR 192 crossing, approximately 4.9 km NW of Mt. Victory and 15.8 km ESE of Somerset.

visited per week, and a collecting circuit of all sites was completed every three weeks. Collection of adults began in June and continued through October 1991 and from April to mid-September 1992. Adults were collected using a D-frame net and a .22 caliber rifle loaded with 1/15 oz. number 12 shot shotshell. During the second collecting season a light weight aerial net was used for collection. Representatives of each species collected were placed in the Natural History Museum of Eastern Kentucky University or in the first author's collection.

RESULTS

Five families of Anisoptera (Aeshnidae, Corduliidae, Gomphidae, Libellulidae and Macromiidae) and two families of Zygoptera (Calopterygidae and Coenagrionidae) were found at Buck Creek (Tables 2 and 3 respectively), including 19 species of Anisoptera (Table 2) and 13 species of Zygoptera (Table 3). This is approximately 25% of the 138 species of Odonata known to occur in Kentucky. Of these 32 species, 17 were new records for Pulaski County, 14 anisopterans (Table 2) and three zygopterans (Table 3).

Table 2. Anisoptera collected at Buck Creek, Pulaski County, Kentucky, (June - November 1991; April - mid-September 1992): * = new county record; A = adult; N = nymph.

Aeshnidae

<i>Basiaeschna janata</i> (Say)	*	A
<i>Boyeria vinosa</i> (Say)	*	A

Corduliidae

<i>Epithea princeps</i> (Hagen)	*	A
<i>Neurocordulia yamaskanensis</i> Provancher	*	A
<i>Somatochlora linearis</i> (Hagen)	*	N

Gomphidae

<i>Dromogomphus spinosus</i> Selys		A
<i>Gomphus (Gomphus) lividus</i> Selys	*	A
<i>Gomphus (Gomphurus) lineatifrons</i> Calvert	*	A
<i>Gomphus (Hylogomphus) viridifrons</i> Hine	*	A
<i>Hagenius brevistylus</i> Selys	*	A
<i>Stylogomphus albistylus</i> (Hagen)	*	A

Libellulidae

<i>Libellula luctosa</i> Burmeister	*	A
<i>Libellula lydia</i> (Drury)		A
<i>Libellula pulchella</i> Drury		A
<i>Erythemis simplicicollis</i> (Say)	*	A
<i>Pachydiplax longipennis</i> (Burmeister)		A
<i>Sympetrum vicinum</i> (Hagen)		A

Macromiidae

<i>Didymops transversa</i> (Say)	*	A
<i>Macromia alleghaniensis</i> (Williamson)	*	A

Table 3. Zygoptera collected at Buck Creek, Pulaski County, Kentucky, (June - November 1991; April - mid-September 1992): * = new county record; A = adult.

Calopterygidae

<i>Calopteryx maculata</i> (Beauvois)		A
<i>Hetaerina americana</i> (Fabricius)		A

Coenagrionidae

<i>Argia fumipennis violacea</i> (Hagen)		A
<i>Argia moesta</i> (Hagen)		A
<i>Argia sedula</i> (Hagen)		A
<i>Argia tibialis</i> Rambur	*	A

Table 3. (Continued)

<i>Argia translata</i> Hagen	A
<i>Enallagma basidens</i> Calvert	* A
<i>Enallagma civile</i> (Hagen)	A
<i>Enallagma divagans</i> Selys	* A
<i>Enallagma exsulans</i> (Hagen)	A
<i>Ischnura posita</i> (Hagen)	A
<i>Ischnura verticalis</i> (Say)	A

DISCUSSION

Kentucky is near the northern or southern limits of distribution of many odonates. Montgomery (1967) used Peterson's Resemblance Equation to indicate the degree of similarity or difference of odonates in the North Central States. The similarity of the species of *Enallagma* of Kentucky and southern Indiana was 0.35, while between Kentucky and Tennessee it was 0.79, where a value of 1.0 indicates total similarity.

Buck Creek was found to possess a very diverse odonate community. The assemblage of a diverse community of Gomphidae was indicative of a relatively undisturbed habitat. One gomphid, *Gomphus lineatifrons* Calvert, has been found to inhabit only streams of high water quality (S. W. Dunkle, pers. comm.; Roback and Westfall, 1967). Carle (1979) reported that of the Anisoptera in Virginia, 75% of those that were rare inhabited relatively undisturbed lotic environments. While Buck Creek is relatively undisturbed, certain perturbations such as clear cutting and gravel removal had occurred during the course of this study. Continued monitoring of Buck Creek is encouraged. Water quality assays and periodic surveys of macroinvertebrates should continue in order to detect any deleterious practices in and around this stream.

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